

**WHAT IS CLAIMED IS:**

1. A dicing and die bonding pressure-sensitive adhesive sheet comprising a base material and a pressure-sensitive adhesive layer disposed thereon, the pressure-sensitive adhesive layer having a ratio ( $M_{100}/M_{70}$ ) of a modulus of elasticity at 100°C ( $M_{100}$ ) to a modulus of elasticity at 70°C ( $M_{70}$ ) being 0.5 or less.

2. The dicing and die bonding pressure-sensitive adhesive sheet according to claim 1, wherein the pressure-sensitive adhesive layer comprises a pressure-sensitive component and a thermosetting component, the pressure-sensitive component comprising an acrylic polymer having a weight-average molecular weight of 30,000 to 500,000.

3. The dicing and die bonding pressure-sensitive adhesive sheet according to claim 2, wherein the acrylic polymer contains repeating units derived from vinyl acetate in an amount of 5 to 50% by mass.

4. The dicing and die bonding pressure-sensitive adhesive sheet according to claim 2 or 3, wherein the pressure-sensitive adhesive layer further contains a thermoplastic resin having a glass transition temperature

of 60 to 150°C.

5. The dicing and die bonding pressure-sensitive adhesive sheet according to claim 4, wherein the weight  
5 ratio of the acrylic polymer and the thermoplastic resin (acrylic polymer/thermoplastic resin) ranges from 9/1 to 3/7.

6. The dicing and die bonding pressure-sensitive  
10 adhesive sheet according to any one of claims 1 to 5, wherein the base material has a surface tension of 40 mN/m or less at a surface which contacts with the pressure-sensitive adhesive layer.

15 7. A process for producing semiconductor devices, the process comprising sticking a semiconductor wafer onto the pressure-sensitive adhesive layer of the dicing and die bonding pressure-sensitive adhesive sheet as claimed in any one of claims 1 to 6, dicing the semiconductor wafer into  
20 IC chips, picking up the IC chips from the base material while allowing the pressure-sensitive adhesive layer to remain adhered to the IC chips, and bonding the IC chips onto die pads by means of the pressure-sensitive adhesive layer with the application of heat and pressure.